Transmission conditions between carbon fiber and epoxy matrix for thin interphases

Abstract:

Fiber/matrix adhesions are most likely to control of the overall mechanical behavior of fiber-reinforced composite materials. In this work, non-linear transmission conditions have been evaluated for a thin intermediate layer which can be considered to be the interphase in an elastoplastic epoxy matrix. The intermediate layer which is situated between two carbon fibers is assumed to be very small in thickness in comparison with those of the surrounding materials. Verification with the numerical simulation based on finite element method (FEM) has shown high accuracy of the derived transmission conditions.